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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/807,723	04/18/2001	Henry Daniell	1464-PCT-US-00	4031

7590 10/22/2002

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EXAMINER
KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/807,723	DANIELL ET AL.	
	Examiner	Art Unit	
	Anne R. Kubelik	1638	

-- The MAILING DATE of this communication appears on the cover sh t with the correspond nce addr ss --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.

4a) Of the above claim(s) *5,8,10-14 and 21-59* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,9,15-20 and 60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *with the application* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☒ Interview Summary (PTO-413) Paper No(s). 9 .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Applicant's election with traverse of Group I (claims 1-3, 6, 15-20 and 60) in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the application complies with unity of invention. Applicant urges that Maliga et al does not teach a promoter driving a multigene operon, but instead teaches fusing a promoterless uidA coding region with the rbcL 3' UTR and showed readthrough from the native rbcL 3' UTR to the exogenous uidA. Applicant urges that because the open reading frames are not expressed in a 1:1 ratio they do not constitute an operon. Applicant also urges that Maliga et al teaches introduction of only a single foreign gene. Applicant introduces pg 9 of Nature Biotechnol, vol. 19 and De Cosa et al (2001, Nature Biotechnol, 19:71-73) to support the uniqueness of the instant invention. Applicant urges that McBride et al do not teach a plastid transformation vector that introduces multiple genes in an operon, but only suggest use of a series of individual genes. Applicant urges that the instant invention, which introduces a Bt operon, resulted in a substantial increase in the production of toxin, and presents Daniell et al (2002, Trends Plant Sci 2:1360-1385) to support this. Lastly, Applicant urges that Meager et al teach nuclear transformation with the MerA and MerB genes.

This is not found persuasive because the technical feature linking the groups is a plastid transformation vector comprising a multi-gene operon. Maliga et al teach constructs comprising uidA and aadA and that these are expressed behind a single promoter (Figs 22A and 25A) and also suggest expressing multiple genes from a single promoter (column 65, lines 19-39). Neither the instant specification nor claim 1 defines an operon as a polycistron that expresses its open reading frames in a 1:1 ratio. Thus, Maliga et al teach the technical feature shared by Groups I-VII and X-XIX, and render claim 1, among others, not novel.

With respect to pg 9 of Nature Biotechnol, vol. 19, De Cosa et al, and Daniell et al, Applicant is arguing limitations not found in claim 1.

The requirement is still deemed proper and is therefore made FINAL.

Claims 4, 7 and 9 should have been included in Group I. Claims 1-4, 6-7, 9, 15-20 and 60 are examined to the extent they read on vectors encoding Bt toxins. Claims 5, 8, 10-14 and 21-59 are withdrawn from consideration as being drawn to non-elected inventions.

Drawings

2. The drawings are objected to for the reasons indicated on the accompanying form PTO 948. Corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. See 37 CFR 1.85(a) and MPEP 608.02(b).

Specification

3. The disclosure is objected to because it contains embedded hyperlinks and/or other forms of browser-executable code. See *e.g.*, pg 3, lines 16 and 21, and pg 4, lines 4 and 10. Applicant is required to delete the embedded hyperlinks and/or other forms of browser-executable code. See MPEP § 608.01.

4. The title of the invention is not descriptive of the instant invention. A new title is required that is clearly indicative of the invention to which the claims are directed. Note that titles can be up to 500 characters long.

5. The abstract is not descriptive of the instant invention. A new abstract is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

6. Claims 2-4, 6-7, 9, 15 and 60 are objected to because of the following informalities:

Claims 2-4, 6-7, 9 and 60 start with an improper article.

In claim 3 "thuringiensis" is misspelled.

Claim 4 is lacking a period at the end of the claim.

In claim 15, --and-- should be inserted after "chaperonin" in line 5.

7. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 7 already states that a gene of the operon encodes a chaperonin.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-4, 6-7, 9, 15-20 and 60 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a plastid transformation vector comprising the cry2Aa2 operon, does not reasonably provide enablement for a plastid transformation vector

comprising any operon. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are drawn to a plastid transformation vector comprising a expression cassette comprising in a 5' to 3' direction of translation a plastid promoter, a selectable marker coding sequence, an operon, and a transcription termination sequence and that have flanking sequences, wherein the operon encodes an insecticidal toxin crystal protein.

The instant specification, however, only provides guidance for the insertion of the cry2Aa2 operon into a chloroplast expression vector to produce a vector that comprises an expression cassette in which the Prrn promoter drives expression of the aadA coding sequence and the cry2Aa2 operon and transformation of the vector into tobacco (pg 20-21, 27 and 29-30); confirmation of integration of the expression cassette in the chloroplast genome of the transformed plants by PCR and Southern analysis (pg 21-22, 27 and 30-32); analysis of CRY2Aa2 protein expression via SDS-PAGE ELISA and electron microscopic analysis (pg 22-24 and 28-29); and feeding tests on the transformed plants to show that they were toxic to tobacco budworm (pg 23-24 and 28).

The instant specification fails to provide guidance for plastid transformation vectors comprising other cry operons. The instant specification fails to provide guidance for plastid transformation vectors that have flanking sequences that allow the vector to be targeted to the chloroplast genome of any plant.

The region of the tobacco plastid genome commonly used for targeting of transformation vectors is not present in the same configuration in the plastid genomes of other economically

important plants; for example, rice (Kanno et al, 1993, Curr. Genet. 23:166-174) lacks the orf131/orf70B gene (see Figure 3). The specification fails to teach a region of the plastid genome that is homologous across all plant species.

The instant specification also fails to teach transformation of the plastids of any plant species other than tobacco. Heifetz (2000, Biochimie 82:655-666) teaches that reliable and efficient plastid transformation and regeneration of fertile plants with transformed plastids has been limited to tobacco and potato (pg 658, right column, paragraph 2).

Given the claim breath, unpredictability, and lack of guidance as discussed above, undue experimentation would have been required by one skilled in the art to develop and evaluate a multitude plastid transformation vectors comprising operons and that can be targeted to the chloroplast genome of any plant.

10. Claims 1-4, 6-7, 9, 15-20 and 60 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to a multitude of plastid transformation vectors that comprise multi-gene operons. In contrast, the specification only describes a plastid transformation vector in which the Prrn promoter drives expression of the aadA coding sequence and the cry2Aa2 operon. Applicant does not describe other plastid transformation vectors encompassed by the claims, and the structural features that distinguish all such nucleic acids from other nucleic acids are not provided.

Hence, Applicant has not, in fact, described plastid transformation vectors that comprise multi-gene operons within the full scope of the claims, and the specification fails to provide an adequate written description of the claimed invention.

Therefore, given the lack of written description in the specification with regard to the structural and physical characteristics of the claimed compositions, it is not clear that Applicant was in possession of the genus claimed at the time this application was filed.

See *Univ. of California v. Eli Lilly*, 119 F.3d 1559, 43 USPQ 2d 1398 (Fed. Cir. 1997):

> The name cDNA is not in itself a written description of that DNA; it conveys no distinguishing information concerning its identity. While the example provides a process for obtaining human insulin-encoding cDNA, there is no further information in the patent pertaining to that cDNA's relevant structural or physical characteristics; in other words, it thus does not describe human insulin cDNA .... Accordingly, the specification does not provide a written description of the invention ....

and at pg 1406:

> a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA," without more, is not an adequate written description of the genus because it does not distinguish the genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function, as we have previously indicted, does not suffice to define the genus because it is only an indication of what the genes does, not what it is.

See *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ 2d 1016 at page 1021:

> A gene is a chemical compound, albeit a complex one, and ... conception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials .... Conception does not occur unless one has a mental picture of the structure of the chemical or is able to define it by its method of preparation, its physical or chemical properties, or whatever characteristics sufficiently distinguish it. It is not sufficient to define it solely by it principal biological property, *e.g.*, encoding human erythropoietin, because an alleged conception having no more specificity than that is simply a wish to know the identity of any material with that biological property.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-4, 6-7, 9, 15-20 and 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Dependent claims are included in all rejections.

It is unclear in claim 1, what it means for a vector to be "stable". Stable compared to what? In what manner?

Claim 1 is indefinite in its recitation of "wherein each step of said multiple genes is carried out by an enzyme". This phrase is largely incomprehensible, as genes do not have "steps".

In claim 1 if the phrase starting with "comprising" in line 4 is intended to modify "expression cassette" it is suggested that "comprising" be replaced with --that comprises--. It is also suggested that if the transcription termination region is the last component of the cassette, that --and-- be inserted after "plastids" in line 6.

Claim 1 lacks antecedent basis for the limitations "said plastids" in lines 5 and 7, "the plastids" in line 6, "the target plastid genome" in lines 8-9, "the heterologous coding sequence" in line 9, "the target plant" in line 10, "the flanking sequence" in line 10, and "the target plastid gene" in line 11.

It is not clear in claim 1 what the phrase "which drives a multi-gene operon" in line 5 is intended to modify. By position it modifies "plastids", but is it intended to modify promoter"?

Claim 1 is indefinite in its recitation of "selectable marker sequence". Is this a sequence that comprises a selectable marker gene or coding sequence or is it itself a selectable marker?

In claim 1, line 6, the phrase "a multi-gene operon which is functional to co-express multiple enzymes in the plastids" is not grammatical. It is suggested that "which is functional to co-express" be replaced with --that co-expresses--.

Claims 1 and 60 are indefinite in their recitation of "flanking DNA sequences which are homologous to DNA sequences inclusive of a spacer sequence of the target plastid genome". It is unclear what the spacer sequence is or what its relationship to the target plastid genome is. It is also unclear what the flanking DNA sequences are homologous to - the spacer sequence? The plastid genome? If the latter, it is unclear to which portion of the plastid genome the sequences are homologous. Lastly, the level of homology is unclear.

Claim 6 lacks antecedent basis for the limitation "the Bt crystal toxin protein" in line 2.

Claim 7 is indefinite in its recitation of "the operon includes .... that MMBR article". Citation of references in clams is not acceptable; this is compounded in this case because such a reference does not exist. The actual genes for the Bt toxins and the chaperonins should be listed. Additionally, the phrase "a putative corresponding chaperonin which facilitates the folding and the corresponding chaperonin facilitates the folding of the BT protein" is repetitive and confusing. Additionally, claim 7 lacks antecedent basis for the limitation "that MMBR article" in line 6.

Claims 7 and 9 are indefinite in their recitation of "putative ... chaperonin". It is unclear if an actual chaperonin is intended or if something that might be a chaperonin is also intended.

Claim 15 is indefinite in its recitation of "the chloroplast of selected plant cells". This appears to imply that the plant cells share a single chloroplast. Additionally, the manner in which the plant cells are selected is unclear.

Claim 15 lacks antecedent basis for the limitation "the transformed plant cells" in line 5.

Claim 16 is indefinite for being dependent upon claim 14. Claim 14 is drawn to a method of controlling an insect by topical application of a protein, while dependent claim 16 is drawn to a method using a step of culturing plant cells. For purposes of examination, claim 16 was treated as though it were dependent upon claim 15, which is a method of transforming the chloroplast of a plant; however, all instances of indefiniteness based on its dependence upon claim 14 are included below. Similarly, dependent claim 18 is drawn to a transformed plant of any one of claims 14-16. As claim 14 is not drawn to a transformed plant, for purposes of examination, claim 18 was treated as though it were dependent upon either claim 15 or 16.

Claim 16 lacks antecedent basis for the limitation "said plant cells".

It is not clear where the steps of claim 16 occur relative to the steps of claim 14 or 15.

It is not clear where the components of the vector of claim 60 are in relationship to the components of the vector of claim 1.

Claim 60 lacks antecedent basis for the limitations "the target chloroplast genome" in line3, "the chloroplast genome" in line 3, "the heterologous coding sequence" in line 4, "the target plant" in line 5, "the flanking sequence" in line 10, and "the flanking sequences" in line 5.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Blowers et al (WO 99/05265).

Blowers et al teach a plastid transformation vector comprising an expression cassette comprising the petunia plastid 16S rDNA promoter, a selectable maker coding sequence, *glpB*, which provides resistance to hygromycin and glyphosate, a multigene operon comprising the *hph* and the *aadA* coding sequences, and the *psbA* transcriptional termination region and flanking the expression cassette regions of homology to the petunia chloroplast genome (the ORF70B and the *trnV*-16S rDNA-*trnI* genes; pg 54-56 and 49-50).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1-3, 6-7, 9, 15-20 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kota et al (1999, Proc. Natl. Acad. Sci. USA 96:1840-1845) in view of Daniell et al (1994, NATO ASI Series, Vol H 86, Biochemical and Cellular Mechanism of Stress Tolerance in Plants, Cherry, ed. Springer-Verlag Berlin, pages 589-604).

The claims are drawn to a plastid transformation vector comprising a expression cassette comprising in a 5' to 3' direction of translation a plastid promoter, a selectable marker coding sequence, an operon, and a transcription termination sequence and that have flanking sequences,

wherein the operon encodes an insecticidal toxin crystal protein and a protein involved in folding the toxin.

Kota et al teach a plastid transformation vector comprising an expression cassette comprising the aadA coding sequence, which provides resistance to spectinomycin, and the *cry*2Aa2 *B. thuringiensis* crystal protein coding sequence expressed behind the plastid promoter *Prr*n and flanking sequences rbcL and accD (pg 1842, left column, paragraph 1, and Figure 1). Kota et al also teach a plastid transformation method comprising transformation of plant cells with the vector, growing the transformed plant cells under conditions that would allow expression of the coding region of the vector, selection of the plant cells in a medium comprising spectinomycin, and regeneration of the selected cells into a plant (pg 1841, left column, paragraph 2, and the paragraph spanning pg 1841-1842). Kota et al do not disclose such vectors comprising a chaperonin coding sequence in the expression cassette or a *cry*2Aa2 operon.

Daniell et al teach the expression of the full-length cryIIA operon in *E. coli*, which encodes a chaperonin (pg 595, paragraph 1), and suggest expressing the entire operon in tobacco chloroplasts (pg 597, paragraph 3). cryIIA is an earlier name for *cry*2Aa2.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the method of plastid transformation with the *cry*2Aa2 coding sequence as taught by Kota et al, to express the Bt operon as described in Daniell et al. One of ordinary skill in the art would have been motivated to do so because of the suggestion of Kota et al to express the entire *cry*2Aa2 operon in chloroplasts because ORFs required for folding Cry2Aa2 proteins are present in that operon (pg 1844, left column, paragraph 1) and because of the suggestion of Daniell et al to express the entire operon in tobacco chloroplasts (pg 597, paragraph 3).

17. Claims 1-2 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turkec (1999, Turk. J. Field Crops 4:85-90) in view of Baumann et al (1988, J. Bacteriol. 170:2045-2050).

The claims are drawn to a plastid transformation vector comprising a expression cassette comprising in a 5' to 3' direction of translation a plastid promoter, a selectable marker coding sequence, an operon, and a transcription termination sequence and that have flanking sequences, wherein the operon encodes an insecticidal toxin crystal protein.

Turkec teaches a plastid transformation vector comprising a expression cassette comprising in a 5' to 3' direction of translation a plastid promoter, two *B. sphaericus* crystal toxin protein coding sequences, and a selectable marker coding sequence (Fig. 1). The vector also comprises flanking sequences for homologous recombination. Turkec does not teach a plastid transformation vector in which the order of the selectable marker coding sequence and the toxin protein coding sequences are switched.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the plastid transformation vector taught by Turkec, to which the order of the selectable marker coding sequence and the toxin protein coding sequences. One of ordinary skill in the art would have been motivated to do so because doing so is an obvious design choice. Additionally, Baumann et al teach that the coding sequences used by Turkec are expressed in *B. sphaericus* within a single transcriptional operon (pg 2047, right column), thus the coding sequences for the crystal toxin proteins comprise no promoters.

18. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turkec in view of Baumann et al as applied to claims 1-2 and 60 above, and further in view of Crickmore et al (1998, Microbiol. Mol. Biol. Rev. 62:807-813).

The claims are drawn to plastid transformation vectors encoding more than one Bt crystal protein in the form of an operon.

The teachings of Turkec in view of Baumann et al are discussed above. Turkec in view of Baumann et al do not teach plastid transformation vectors encoding more than one Bt crystal protein expressed behind a single promoter.

Crickmore et al teach a variety of Bt crystal protein genes (Table 1).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the plastid transformation vectors encoding several *B. sphaericus* crystal proteins as taught by Turkec in view of Baumann et al, and to express several Bt crystal protein genes as described in Crickmore et al. One of ordinary skill in the art would have been motivated to do so because of the suggestion of Turkec to do so (pg 85 and 88).

19. Claims 1 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over McBride et al (US 5,545,817 A, 1996).

The claims are drawn to a plastid transformation vector comprising a expression cassette comprising in a 5' to 3' direction of translation a plastid promoter, a selectable marker coding sequence, an operon, and a transcription termination sequence and that have flanking sequences.

McBride et al teach plastid transformation vectors that have expression cassettes comprising in a 5' to 3' direction of translation a plastid promoter a *Bacillus thuringiensis* (Bt) crystal protein coding sequence, a selectable marker coding sequence and a transcription

termination sequence and that have flanking sequences (column 6, lines 3-15, and column 7, line 53, to column 8, line 5, and Fig. 1). McBride et al state the plastid transformation constructs of their invention may include a "number of consecutive encoding regions, to be expressed as an operon" (column 2, lines 56-63). McBride et al do not teach plastid transformation vectors in which the components of the expression cassette are in the following order: promoter, selectable marker gene, operon, and transcriptional termination sequence.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the plastid transformation vectors taught by McBride et al, to alter the order of the components of the expression cassette and to express a number of consecutive encoding regions. One of ordinary skill in the art would have been motivated to do so because of the suggestion of McBride et al to include operons in their plastid transformation vectors. Altering the order of components is an obvious design choice.

20. Claims 1 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maliga et al (US 5,877,402 A, 1999).

The claims are drawn to a plastid transformation vector comprising a expression cassette comprising in a 5' to 3' direction of translation a plastid promoter, a selectable marker coding sequence, an operon, and a transcription termination sequence and that have flanking sequences.

Maliga et al teach a plastid transformation vector that comprises a plastid promoter, a uidA coding sequence, a selectable marker sequence, a transcription termination region, and flanking regions homologous to the target plastid genome (Fig. 22). Maliga et al also teach methods of plastid transformation (Fig. 30, column 65, lines 19-39, and column 66, lines 16-39). Maliga et al also suggest expression of gene clusters in plastids via plastid transformation vectors

(column 65, lines 19-39). Maliga et al do not disclose do not teach plastid transformation vectors in which the components of the expression cassette are in the following order: promoter, selectable marker gene, operon, and transcriptional termination sequence.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the plastid transformation vectors taught by Maliga et al, to alter the order of the components of the expression cassette and to express a number of consecutive encoding regions. One of ordinary skill in the art would have been motivated to do so because of the suggestion of Maliga et al to include operons in their plastid transformation vectors. Altering the order of components is an obvious design choice.

Double Patenting

21. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

22. Claims 1-4, 6-7, 9, 15-20 and 60 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 5 of copending Application No. 09/807,742. An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim not is

patentably distinct from the reference claim(s) because the examined claim is either anticipated by, or would have been obvious over, the reference claim(s). See, *e.g.*, *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the plastid transformation vector comprising a Bt cry2Aa2 operon claimed in the copending application is a species of the genus of plastid transformation vectors comprising operons, including those that encode Bt insecticidal crystal proteins and their chaperonins, claimed in the instant application. Thus, the claims of the instant application are obvious in view of the claim of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

23. No claim is allowed.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (703) 308-5059. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Anne R. Kubelik, Ph.D.
October 15, 2002

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